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unfortunately too vague for me to give you an answer. If you can state -- you're asking me as I understand it whether this opinion which is just merely a summary of a later section of my report goes beyond something and I need to know what the something is specifically to be able to give you a yes or no answer to that.

Q. The something is what we just talked about which essentially my understanding is that your view is that it is -- that Dr. Hakala's use of dummy variables in performing his event study in this case is not per se inappropriate based on the literature. Is that accurate?

A. No. My opinion goes beyond that.

Q. Okay.

A. That is a -- I would not disagree with that statement. But that is a weak -- a weaker statement than I am making. My opinion goes beyond it in that I point to specific affirmative precedents in thinking that has been captured in peer reviewed scholarly literature. It's not just that it does not per se -- that it's not per se inconsistent.

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It has specific affirmative precedents in scholarly literature.

Q. But, again, none of those papers, none of those -- none of that literature specifically uses dummy variables in the way that Dr. Hakala has done so.

MS. RODON: Objection.

A. I suppose you must have in mind some -- none of that literature uses -- that I have seen uses dummy variables in exactly the way Dr. Hakala did in this case but I wouldn't expect it to. That is a -- that is -- that's not a reasonable thing to expect. There are examples in that literature that recommend and indeed use statistical procedures that are exactly like the statistical procedure Dr. Hakala used in this case.

Q. Let's talk about the Atkas article. Does the Atkas article use dummy variables the way Dr. Hakala has done?

MS. RODON: Objection.

A. I do not know and cannot know from the Atkas article exactly how the Atkas authors implemented their procedures, their

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calculations. So I can't give you a definite yes that in terms of mechanical -- the mechanical level of implementation that is exactly what they did. What I can say about Atkas is that that is exactly what they recommend in part and it may well be what they did in the construction of their tables of results. I just -- there's more than one way, in other words, to get to the -- to perform the same calculation as I have testified here earlier today in a relevant context. And I don't know which particular path the Atkas co-authors followed to get to their numeric results. They may well have done exactly what Dr. Hakala did in this case. One simply cannot tell. Just as Dr. Hakala could have gotten to exactly where he got in this case without the use of the multiple dummy variables.

Q. The Atkas paper uses something called the two-state market model, does it not?

A. It uses the two-state market model as an expository mathematical device, yes.

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Q. And the Atkas paper doesn't use multiple dummy variables to control for event dates, does it?

A. As I've already testified, there are points in the Atkas paper where one simply cannot tell where they may well have done that or they may have done something that gets to the same end point by other means, and it's simply irrelevant from a mathematical or statistical point of view whether the procedure that they used -- whether they did it by means of dummy variables or whether they did a mathematically precise equivalent alternative which is to drop certain observations. It is of no mathematical or statistical or econometric import whether you go one of these ways or the other.

I can't tell, as I've already testified, which way Atkas, et al. went because they are not as explicit as Dr. Hakala about how they implemented their procedure. They may well have done exactly what he did. I can't tell.

Q. Dr. Hakala does not use the

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A. He does not. Nor does he use the GARCH or the BMP or several other technical devices that are used in the Atkas paper. It is true.

He does -- what Dr. Hakala describes as the rationale for his method is in fact -- plays the role of the two-state market models. He doesn't call it that. So I would not say that it is absent from his work in this case. He doesn't use that terminology.

MR. SCHWARTZ: Can you mark this as I guess Exhibit 4.

(Maraïs Exhibit 4, Journal of Corporate Finance article entitled Event studies with a contaminated estimation period, marked for identification as of this date.)

BY MR. SCHWARTZ:

Q. So is it your view that Dr. Hakala does use the two-state market model?

MS. RODON: Object to the form.

A. I think I have covered that as

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well as I can in my previous answer so I'll stand on my previous answer.

Q. Okay. Well, I understood your previous answer to be that it's not absent. So I'm trying to figure out what that means. Atkas -- you've just been handed the Atkas article. Is this the Atkas article that you had in mind that we've been talking about?

A. It seems to be the same Atkas article that is attached to my report, yes.

Q. So if you could turn to page 135 of the article, please.

A. I'm there.

Q. Okay. Now, if you could see in Section 3.25, the authors discuss the two-state market model test?

A. Yes. I see that.

Q. Okay. On page 136 they provide some equations. Do you see that as well?

A. I see those.

Q. Does Dr. Hakala use those equations in performing his event study in this case?

MS. RODON: Objection.

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A. I'm just reviewing the equations to see whether in form Dr. Hakala -- whether in substance Dr. Hakala does do this without ever actually using the equations.

I don't believe -- I have no reason to think that Dr. Hakala ever actually constructed computer code for his analysis from these equations. I don't have any reason to think that he did although I can't rule it out. I've not reviewed his computer code. But, no, I don't -- equation -- there are three equations on this page. The -- I would say that the first of the three equations with the surrounding text, equation 17 that is, captures quite closely what it is that Dr. Hakala is doing in his analysis in this case even though he did not construct -- I have no reason to think he constructed his computer code from this equation.

Equation 18 is something that Dr. Hakala did do in this case. And equation 19 is simply not relevant to this case. Equation 19 goes to a question that is not asked in this case. So that would be my answer.

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Q. Okay. Equation 18 is an equation for determining the standard -- the estimated standard error, though; is that correct?

A. No.

Q. Okay. What is equation 18?

A. Equation 18 divides an estimated abnormal return by the standard error of that estimated abnormal return to form a T statistic for that abnormal return. Dr. Hakala's report is full of T statistics for abnormal returns constructed in exactly the way that equation 18 illustrates. For example, all of the T statistics in Exhibit B-1 are constructed in exactly this way.

Q. Right. But the equation 18 for constructing the T statistic has nothing to do with his use of dummy variables.

Well, let me rephrase that.

It's not an implementation of his use of dummy variables, is it?

MS. RODON: Objection.

A. Equation 18 is an equation on a page that defines a standardized abnormal return. It says nothing about dummy

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variables. I would agree with that. There's nothing on that line of that page that says anything about dummy variables.

Q. T statistics are used in a lot of event studies, correct?

A. That is correct.

Q. In event studies do people calculate the T statistic -- is equation 18 a standard equation that people use to calculate T statistics in performing event studies?

A. Not just -- I think that's fair. And there may be circumstances in which a T statistic formula can be written in other ways but this is a very standard way of writing the equation for a T statistic in event studies and outside the context of event studies.

Q. So with respect to equation 17, is it your testimony you don't know whether Dr. Hakala has used that equation or is it your -- well, is it your testimony that you don't know whether Dr. Hakala has used that equation?

MS. RODON: Objection.

A. My testimony was that I have no reason to think that Dr. Hakala created any

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code using this equation as a starting point. But this equation and the surrounding text that explains what the elements of this equation mean, what they are, captures very closely what Dr. Hakala was doing in his report. This is an explanation for -- this is a mathematical way of describing what the underlying structure of what Dr. Hakala was doing in his report.

Q. Are you saying that equation 17 has the same purpose as the type of dummy variable analysis that Dr. Hakala performed?

MS. RODON: Objection.

A. It's aimed in the same direction, yes. And it's not just that it -- your question allows the possibility that equation 17 is something completely different from Dr. Hakala's procedure but it just so happens they have the same purpose. It goes beyond that. They have the same ingredients. They have exactly the same ingredients. The ingredients going into Dr. Hakala's procedure are the ingredients that are mathematically formulated here in connection with page 17 -- or equation

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17.

Q. Do Atkas and his co-authors dummy out 60 percent or 56 percent of their event -- of their estimation period?

A. They do not do that to -- as far as I know from my reading of this article. I don't know what they might also have done in the background that is not actually included in the published version of the article but I don't see anyplace where they dummy out 56 or 60 percent of variables. They don't rule it out anywhere and it's perfectly consistent with what they write and they write nothing that contradicts it or bars it. But I don't know of anyplace where they actually do it in their specific individual numerical example which is all it is. In terms of their mathematical formulation and the reasons they provide, they assume no particular percentage and they rule out no particular percentage.

Q. Do Atkas and his co-authors, do they identify what they mean by -- what dates they're trying to control for during their estimation -- what types of observations

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they're trying to control for during their estimation period?

MS. RODON: Objection.

A. Yes.

Q. And what are they?

A. Those are dates that they refer to as the contaminating event dates. Those are information arrival dates.

Q. And did they describe what information -- what types of information arrive on the contaminating event dates?

A. The contaminating event dates in their actual study are artificially induced by them. They have no -- because this is -- because the contaminating events in their study are artificially introduced by them there is no -- there is no meaningful answer to what information was this. They give examples of the kinds of things that these might correspond to but they are examples. They are illustrations. They don't say -- they say e.g. and then list some things.

Q. And what are some of those examples if you recall?

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A. There's a passage that I recall where I -- that I would have to find.

Q. I think it may be on page 137. (Document review.)

A. Yes. That is what I was thinking of. The examples they gave, parenthetically, various -- their characterization is various corporate event announcements. But then they add parenthetically, e.g., M&A operations, share buybacks, earning announcements.

Q. Do they talk about third-party announcements at all?

A. I don't recall anyplace that rules them out or anyplace that specifically includes them. I would have to reread the article to be sure that there was no reference one way or the other but I don't recall as I sit here.

Certainly their characterization of what they are describing does not in anyplace that I can recall rule it out. And there would be no logical reason to rule it out.

Q. Do Atkas and his co-authors, do

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they recommend an a priori selection of dates without reference to price movement or statistical significance for determining what dates to control for during the estimation period?

MS. RODON: Objection.

A. I don't recall any specific mention in the article. Again, I would have to reread it to be sure one way or the other. I just don't -- it would be so commonplace an idea amongst the -- in the profession that a method of selection that was not a priori would be questioned that it's not -- it doesn't surprise me that people don't write that down repeatedly. But I don't recall any specific mention of it in this article.

Q. Well, what problem are Atkas and his co-authors addressing?

MS. RODON: Objection.

A. I think it's well captured in summary in the title of the article. Event studies with a contaminated estimation period by which they mean an estimation period that includes the dates of news events pertaining

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to the firm, to the firm being under study, under analysis, but which are extraneous to and irrelevant to the purpose of the analysis.

However, including those dates in the estimation period creates -- the estimation being a template, a baseline for recognizing unusual abnormal returns. It includes in the baseline period information effects. So it's not a true clean baseline. That's the problem that they are addressing and that is what they have in common with the thinking in Dr. -- behind Dr. Hakala's method.

Q. So then why is the -- why is an a priori selection -- why does that necessarily flow from the problem they're addressing if the purpose they're addressing is to remove contamination from their estimation period?

MS. RODON: Objection.

A. I'm not sure I follow what you -- what your question drives at. So let me restate it as follows and ask whether that is what you're asking me.

Why is it important if one is going to do this to do it with an a priori

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selection as opposed to first studying price movements and then selecting news events based on price movements; is that the question?

Q. Not exactly. The question is why is it appropriate to do an a priori selection without first determining the actual dates on which there is, in fact, contamination?

MS. RODON: Objection.

A. Your question tends -- is almost -- is internally contradictory in that a priori selection is the way to identify potentially contaminating dates without being misled by or giving the appearance of data mining that is capitalizing on chance effects. There are a lot of price movements that scholars in finance and accounting are unable to explain fully. That is in itself the subject of an area of research.

And to begin with the dates of large price movements and then go and look for news events corresponding to those would be exactly the opposite of an a priori procedure and it would be a procedure that edits -- that it imparts a selection bias driven by chance

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in part by chance phenomenon to -- that imparts a selection bias to the data that are retained in the analysis.

In other words, if Dr. Hakala had specifically set about removing any day when the price moved a lot from his analysis, then undoubtedly Dr. Stoltz or somebody in the position of Dr. Stoltz would be saying this -- the result of Dr. Hakala's analysis is pure selection bias. Of course, he gets a small variance of abnormal returns if he has hand picked for exclusion all the large abnormal returns. What would you expect? But instead of that, what Dr. Hakala does is to select days for removal a priori without looking at the price movements. It turns -- and he does that as I understand it because of their potential for creating price movements but without tainting the selection by the happenstance of which days did happen to have -- the partial happenstance of which days did happen to have the large price movements.

So it cannot be said that the effect of Dr. Hakala's procedure is

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predetermined by his cherry-picking of only the small price movement days to retain in the sample.

This is a large topic and I've already given a larger answer than I had intended but that's -- that I think captures fairly well the reason.

Q. Atkas and his co-authors, turning back to page 137, say that figure 1 which I believe is on 138 represents a typical result.

Do you see that?

A. Where on page 137 is that?

Q. It is in the first -- it's in the last full paragraph on the page.

A. Okay. Figure 1 presents a typical result and I would have to read back to see typical of -- to fully -- perhaps I don't need to for your question, but I don't know what they mean when they say a typical result because I haven't read the preamble.

Q. If you want to read the preceding paragraph or two that's fine.

A. It depends entirely on what question you have in mind. If I need to I

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can.

Q. How many event dates do Atkas, et al. control for in their simulation?

A. Their simulation uses a variety of statistical methods, some of which don't know a specific number of event dates. So your question -- the answer is not necessarily any specific number. There is an exception to that where they do in table 1, for example, precisely what Dr. Hakala did if they implemented it with dummy variables which they don't say. And that's in the row labeled Manual in table -- in all the tables here.

And in that case what they control for is exactly the number of days of contamination that they inserted into the data in the first place because they assume for the exercise perfect knowledge of when the contamination happened.

Q. How many dates did they insert -- how many contaminated dates did they insert?

A. It's a -- rather than rereading Atkas to get that straight I'm referring to my report where I know I make reference to this.

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Q. That's fine.

A. As a reminder.

Okay. My -- I'm looking at my footnote 3 which directs me to Section 4.2 of the article on page -- again, on page -- as it turns out -- 137.

And the answer is that on average they insert two episodes of contamination but each could have multiple days in it. I say on average because the relevant text is in the second full paragraph of page 137, first -- and it reads, "First a random sample was drawn from a Poisson distribution with a mean of 2."

So -- then it says, "This value, denoted by lambda star, represents the number of events during the estimation window."

Your question is how many events. And the answer is they draw the number of events from a Poisson distribution whose maximum possible value is infinity or unbounded but whose average is 2.

So they -- depending which draw they're getting from the Poisson distribution it could be zero contaminating events or one

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or two or three or four and so on governed by the Poisson distribution.

Your question was about days, though. And the rest of the paragraph says, "The length of the number of days of each event was randomly sampled from a Poisson distribution."

So again it's random. But in this case the average is four. So when an event occurs its average length is four but it could be one or two or nine or 17. And so on.

Q. Do you know whether the Atkas article is well accepted in the accounting and -- academic accounting and finance fields?

MS. RODON: Objection.

A. I don't know the -- how I -- how it's possible to measure something like that as recently after the publication of Atkas. It is certainly -- it passed scrutiny in the peer review process of a peer reviewed journal published by a prestigious publisher of scholarly journals.

It would surprise me if there were clear-thinking people in the field who

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rejected what Atkas, et al. say. But I -- anything's possible.

Q. Do you know whether -- do you know how many times Atkas has been cited since this article came out?

MS. RODON: Objection.

A. I don't know. I know that it would not be many and it might even be zero given the recency of the publication of Atkas and the lead time that it takes for scholarly publication to actually reach the point of publication and indexing. So one question would be how many detected citations there are to Atkas and that would have to be very small given the date of publication.

How many research article papers there are out there in the world today that make reference to that I don't think anyone can know that.

Q. So do you know whether there have been any academic articles in the finance or accounting literature that have been dealing with event studies that have been published since Atkas -- the Atkas article came out?

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MS. RODON: Objection.

A. No, I don't.

Q. So you don't know whether there have been any articles in that field that have implemented Atkas's methodology whether or not they specifically cite to Atkas.

MS. RODON: Objection.

A. I don't know how many articles have been published, have appeared in print since the particular date of Atkas. And I don't know how many times, if ever, the methodology that Atkas recommend, the specific method that they recommend, has been adopted. Has been used.

Q. And what do you mean by the specific method that they recommend?

A. Well, they -- their applications in this article -- you draw distinction between what is the problem that they are considering which, as I have already testified, is exactly the problem that Dr. Hakala considered and solved in the way that he did. They -- their article concerns event studies with many, many firms in the study

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sample.

And so they deviate from the track that Dr. Hakala is on at that point because their empirical applications concern multiple event studies and Dr. Hakala's analysis by its nature concerns a single firm.

They say in the article that a natural response to the problem that both they and Dr. Hakala are solving appears to them to be as it turns out exactly what Dr. Hakala did. But then they go on to say that in a massive event study where there are hundreds or thousands of firms potentially, it's not practical to follow that -- what they call the brute force approach of excluding the contaminating dates or even attempting that as a practical exercise. And so they go off in another direction with purely statistical filtering for the effect of contaminating events.

Now, they end up concluding that their method based on -- on an extension of the two-stage market model with switching regressions with a Markovian structure, they

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find in a certain kind of sample application in a numerical example works about as well as anything. But all of that is irrelevant to the Hakala application because that veers off in the direction of their main topic that is about what can one do about this in the case of mass event studies that deal with hundreds or thousands of firms.

So the contact between Hakala and Atkas is very close up to the point where Atkas point themselves at a different kind of application from the one that Dr. Hakala has. That's what I -- your question was what do I mean by their method and they end up with the two stage, Markovian two-stage market model that they arrive at. That's the method that I was referring to.

Q. Where in the Atkas article did they recommend for controlling for all potentially material event days in the estimation period?

A. I don't think they have language that says exactly those words. On page 130 they get quite close when they point out that

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the estimation period has attracted less analysis than other features of event studies and then they say, "In particular, unrelated events may be present during the chosen estimation window which bias the estimation of the return-generating process."

Now, Dr. Hakala could have had that sentence -- could have taken that sentence wholesale into his report.

And the next sentence, "Natural solution seems to be choice on a case-by-case basis an estimation window free of such contaminating events."

Now, how is one to do that. That's where you're -- that's what you're asking me about. Where do they say to do that. This is where they say to do that. Because in the practical -- in their artificial examples in this paper they know exactly where the contaminating events occurred. And the reason they know exactly where the contaminating events occurred is that they inserted the contaminating events artificially on those dates so there is no

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question that they know where the contamination occurred.

But in the real world one does not know that and needs to use secondary methods that have -- that use imperfect information such as the method that Dr. Hakala used. That's exactly where they recommend it. They don't -- since their experiment doesn't go to real world data, it never reaches real world contamination, they never get to the point of doing exactly what Dr. Hakala does. But that's where it flows from.

Q. They say, do they not, "Unrelated events which may be present during the chosen estimated window -- estimation window which bias the estimation of the return-generating process parameters."

Do you see that in --

A. I do see that.

Q. Is it your view that when they talk about unrelated events during the chosen estimation window which bias the estimation of the return-generating process parameters, they mean by that all potentially material event

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days as used by Dr. Hakala in his event study?

MS. RODON: Objection.

A. No. I believe that at that point they are talking about contaminating event days in principle as if at that point it's a theoretical reference without consideration in that sentence as to how practically speaking in the real world you could know what days those -- on what days those events occur.

It's perfectly possible and appropriate and coherent for them to be writing about the biasing effect of the real announcement days and to be referring to the real announcement days without in the same sentence considering, yes, but how could you know what days those are when you are doing an exercise in the real world.

They never reach that question in their own exposition as Dr. Hakala had to in his report. But if they did, it is extremely likely and indeed they give us a clue to it here that they would arrive at the same kind of resolution, if not the same protocol, but the same kind of resolution that Dr. Hakala

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does.

Q. The next sentence, the one you referred to, where it talks about a natural solution says would be to choose an estimation window free of such contaminating events.

Do you see that?

A. Yes.

Q. Do you understand such contaminating events to mean other than the contaminating events that they reference in the prior sentence?

A. No. Precisely that kind of contaminating event. It still doesn't get to how would you do that in the real world since where you -- where you don't have the sort of knowledge that they have of the -- of what lies behind the veil in their own experiment.

Q. I thought you said that the natural solution sentence all but recommends Dr. Hakala's approach. Or at least is very consistent with it.

A. Yes.

Q. Okay. But you just said that

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there -- that sentence doesn't talk at all about how you would actually implement -- how you would actually implement what it is that they're talking about so I don't -- how is it that the two can possibly be consistent?

MS. RODON: Objection.

A. I'm really not sure what has been unclear but let me take -- take it this way. And I think that this should help clarify what -- the problem that your question seems to suggest.

Atkas, et al. are concerned with events that contaminate the estimation period by imparting high variance to abnormal returns on certain dates in the estimation period. They say in effect, I'm now paraphrasing them, natural solution would be to get rid of those dates. Then they say in a mass event study, that's not really practical. And so they -- as I've described it previously, they veer off in the direction of, well, what could you do in a mass event study.

But had they not made that -- had they stuck to the subject of what do you do

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with a single firm, they would then have to meet what in the real world do you mean by getting rid of those event dates.

In their own artificial exercise when they reach that point they get rid of exactly the dates to which they added artificial events. They know what those dates are because they added the artificial events to them.

That does not meet the real world problem of knowing what are the dates of -- what are the potential dates -- on what dates could contaminating events have happened.

Now, you asked me previously about a priori and I testified about a priori and the importance of a priori selection as opposed to data mining. If you're going to do that a priori, the way you would have to do that, really the only way to -- the only possible way to do that is to consult news indexes for a record of news releases occurring on certain dates. And deciding on some threshold for which of these events could move prices.

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Now, as I understand it that's what Dr. Hakala did. That's a practical implementation of exactly what Atkas, et al. recommend in the text we've been reading without the luxury that Atkas et al. provide to themselves by knowing exactly which are the right dates because they actually intervened and inserted the contamination on those dates.

Q. Atkas and his co-authors don't discuss the magnitude of the events they believe contaminate the event window, do they? Not the event window. The estimation window. Do they?

A. I don't think that's quite right. The same text that you pointed me to on page 137 discusses the magnitude of the artificial events that they themselves introduce in their experiment.

However, in this section of the -- this completely conceptual theoretical discussion, I don't think there's any mention of magnitude here.

THE VIDEOGRAPHER: We're now going off the record. The time is 1:29 p.m.

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1 L. MARAIS
2 (Luncheon recess taken at 1:29
3 p.m.)
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1 L. MARAIS
2 AFTERNOON SESSION
3 (Time noted: 2:16 p.m.)
4 THE VIDEOGRAPHER: I'm going to
5 ask you to stand by, please.
6 We are back on the record. The
7 time is 2:16 p.m. This is the beginning
8 of the tape labeled number three.
9 ***
10 LAURENTIUS MARAIS,
11 resumed and testified as follows:
12 EXAMINATION BY (Cont'd.)
13 MR. SCHWARTZ:
14 **Q. Dr. Marais, turning back to the**
15 **Atkas article, there is no discussion in**
16 **Atkas, is there, about how they would**
17 **recommend implementing their recommended**
18 **approach in a single company event study; is**
19 **that correct?**
20 MS. RODON: Objection.
21 A. That's not strictly correct.
22 There is -- as I testified before the lunch
23 break, there is a gap between where they stop
24 and the real world implementation. But to say
25 that there is no recommendation is just not

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2 correct. In fact, it's wrong.
3 **Q. Well, let me stop you there. I**
4 **don't think I said that there's no**
5 **recommendation. I said that there is no**
6 **discussion of how you would implement it.**
7 **That was the question.**
8 A. That's fair. There's no
9 discussion of that gap.
10 **Q. And Atkas and his co-authors do**
11 **not describe the criteria that should be used**
12 **to determine contaminating events in a real**
13 **world single-company event study, correct?**
14 A. That also is fair. They don't get
15 into that.
16 **Q. Now, you testified earlier, I**
17 **believe, that you weren't certain that there's**
18 **enough detail in Dr. Hakala's expert report in**
19 **this case to know the specific protocol he**
20 **used to determine material event days; is that**
21 **also correct?**
22 MS. RODON: Objection.
23 A. That is correct.
24 **Q. And you did not --**
25 A. If I --

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2 **Q. I'm sorry.**
3 A. I'm not sure -- on second
4 thoughts, could I hear that question read back
5 and I just want to make sure I heard it
6 correctly the first time around.
7 (Record read.)
8 A. Yes. That's fair. I'm not
9 certain there's enough detail in that.
10 **Q. And you didn't -- you didn't**
11 **review Dr. Hakala's specific determinations as**
12 **to whether any particular date was a material**
13 **event date against his criteria to determine**
14 **whether he decided that correctly; is that**
15 **also fair?**
16 A. That is also correct.
17 **Q. So there's no way to know whether**
18 **Dr. -- whether the protocol Dr. Hakala used in**
19 **determining material event days in his event**
20 **study would match up with what Atkas and his**
21 **co-authors would recommend with respect to**
22 **implementing their proposal in a single**
23 **company event study; is that also correct?**
24 MS. RODON: Objection.
25 A. I don't know -- it is correct that

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2 I don't know on the basis of any specific
3 statement in the article what they would have
4 done if, given Dr. Hakala's assignment in this
5 case, whether they would have ended up exactly
6 in the same place or some other place.

7 **Q. And that's not a question on which**
8 **you formed an expert opinion in this case.**

9 A. That's correct.

10 **Q. Atkas and his co-authors don't**
11 **discuss, with respect to -- I'll withdraw**
12 **that.**

13 **Atkas and co-authors don't discuss**
14 **the magnitude that an event must have in order**
15 **to be considered contaminating, other than in**
16 **the context of their -- of their simulated**
17 **example; is that correct?**

18 A. I'm not sure I can agree with that
19 as you have said it. There is -- there's no
20 question from their mathematical formulation
21 that contaminating events have a variance
22 increasing effect. It is -- but it is true
23 they didn't say by how much.

24 **Q. And you can't tell from what Atkas**
25 **and his co-authors say in this paper whether**

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2 **there is some minimum threshold they would**
3 **require a contaminating -- some minimum**
4 **threshold of increased variance they would**
5 **require a contaminating event to meet before**
6 **they would recommend controlling for it.**

7 MS. RODON: Objection.

8 **Q. Is that also correct?**

9 A. It is -- if they were to recommend
10 a threshold at all, it is correct to -- that
11 they don't say what it would be in this
12 article. The article makes no reference
13 whatever to a threshold. It considers two
14 classes of events. Or it considers two
15 classes of re -- of returns days, those with
16 news events and those without. That's the
17 distinction. They don't talk in terms -- they
18 don't discuss the issue in terms of magnitudes
19 and thresholds.

20 **Q. The only description of the types**
21 **of news on contaminating event days that Atkas**
22 **give -- Atkas, et al. gives are the examples**
23 **we previously discussed on page 137 of the**
24 **article; is that correct?**

25 A. I don't know whether it's correct

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2 without, as I indicated previously, reading
3 the whole article. That's the only one that
4 comes to mind as I sit here. I don't recall
5 if they discuss it -- if they give examples
6 anywhere else.

7 **Q. You've read this article before,**
8 **though, correct?**

9 A. I have read it.

10 **Q. And did you reread it in**
11 **preparation for your deposition?**

12 A. I did.

13 **Q. And do you recall -- either from**
14 **the prior reading or rereading do you recall**
15 **that there were, in fact, other examples of**
16 **the types of news announcements they --**
17 **they're talking about on -- or on material**
18 **event days?**

19 A. I don't recall that there were
20 other examples. But I don't know as I sit
21 here that there were none. I just don't
22 recall one way or the other.

23 **Q. And the examples that we talked**
24 **about before on page 137, those are corporate**
25 **announcements on M&A activity or share**

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2 **buybacks, earnings releases, things of that**
3 **nature?**

4 A. Not things of that nature. But
5 the examples listed here are exactly those
6 things.

7 **Q. Now, is contamination a new idea**
8 **that originates with Atkas and other -- Atkas**
9 **and his co-authors?**

10 MS. RODON: Objection.

11 A. No. I don't believe so.

12 **Q. And the event study methodology**
13 **has been for some time; is that also correct?**

14 A. Practically everything has.

15 **Q. Many event studies have been**
16 **published in peer reviewed financing and**
17 **accounting literature; is that correct?**

18 A. Yes.

19 **Q. Many of them do not control for**
20 **contamination in the estimation period; is**
21 **that also correct?**

22 A. Not entirely, no.

23 **Q. Okay. How is that not correct?**

24 A. The idea of having an event -- an
25 estimation period that is free of perturbing

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2 events or price perturbing events is not at
3 all novel. Very often that idea is
4 implemented by simply choosing an interval to
5 serve as an estimation period and bounding
6 that interval in such a way that it does not
7 include some potentially perturbing events.

8 Now, that's superficially
9 different from including those potentially
10 perturbing events and then using dummy
11 variables to effectively exclude them from the
12 regression. It is superficially different but
13 it is not different in substance and in that
14 sense that's what I had in mind when I
15 disagreed and said that it's not entirely
16 correct that -- I think your premise if I
17 remember it is that it's not been done before.

18 **Q. I was asking if it had been.**

19 A. Oh. And the answer is yes, it has
20 in the sense that I've just described it.

21 **Q. So when Atkas and his co-authors**
22 **are talking about a natural solution could be**
23 **to choose an estimation window free of such**
24 **contaminating events, they could be talking**
25 **about choosing an estimation period that's**

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2 **bounded in such a way that it does not include**
3 **those types of events -- contaminating events;**
4 **is that -- that doesn't need to be implemented**
5 **through dummy variables; is that correct?**

6 MS. RODON: Objection.

7 A. They could indeed be. That would
8 be a way of implementing what they describe.

9 **Q. Dr. Marais, what is a type 1**
10 **error?**

11 A. The short version would be that a
12 type 1 error is a false positive in
13 statistics.

14 **Q. Dr. Marais, are the exhibits to**
15 **your expert report attached to what we've**
16 **been --**

17 MS. RODON: Yes.

18 MR. SCHWARTZ: Okay.

19 **Q. So could you turn to Exhibit D**
20 **then of your expert report.**

21 A. Exhibit D. Yes.

22 **Q. This is an article by Joel**
23 **Thompson?**

24 A. That's correct.

25 **Q. And you cite this article in your**

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2 **expert report?**

3 A. I do.

4 **Q. Could you turn to page 83 of the**
5 **article, please.**

6 A. I'm there.

7 **Q. Could you look at the sentence**
8 **that follows beneath table 3 beginning with,**
9 **"Examination of this table..."**

10 A. The sentence, okay.

11 Examination...

12 I see that.

13 **Q. Okay. Now, do you understand that**
14 **he's talking here about the results of what**
15 **happens when he controls for extraneous**
16 **events?**

17 A. I do.

18 **Q. And he says that the improvement**
19 **is small and tends to be accompanied by an**
20 **increase in type 1 errors.**

21 **Do you see that?**

22 A. I do see that.

23 **Q. Now, did you determine -- did you**
24 **do any testing to determine whether Dr.**
25 **Hakala's event study methodology, his use of**

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2 **dummy variables in -- let me withdraw that.**

3 **Did you do anything to test**
4 **whether Dr. Hakala's use of dummy variables in**
5 **his event sudden increase type 1 errors?**

6 A. I did no calculation of that kind.
7 I have no reason to think that, properly
8 construed, his analysis, his method, has any
9 relevance to that question. But in -- I did
10 not -- I performed no calculation to verify
11 that understanding.

12 **Q. Well, do you believe that the**
13 **process that Dr. Thompson is describing is**
14 **similar or consistent with the process that**
15 **Dr. Hakala uses with dummy variables in his**
16 **event study?**

17 MS. RODON: Objection.

18 A. It is very similar in concept.
19 The execution is different. But it is similar
20 in concept.

21 **Q. So Dr. Thompson found that type 1**
22 **errors increased when he controlled for**
23 **event -- when he controlled for extraneous**
24 **events. So does that give you any reason to**
25 **think that Dr. Hakala's -- that Dr. Hakala's**

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control for extraneous events may also
increase type 1 errors?

MS. RODON: Objection.

A. It raises -- it identifies the question of whether that -- it identifies that question. It certainly brings it up. I have no reason to think that it happens in Dr. Hakala's study but the procedure has the effect of making the instrument more sensitive. One of the side effects of greater sensitivity can be a higher rate of false positives. That's what a type 1 error is.

Q. Do you have any reason to believe that Dr. Hakala's use of dummy variables does not increase type 1 errors?

A. I have no reason to think that his procedure has any effect on type 1 errors in any systematic effect, either up or down. His procedure is calibrated in such a way that it has a 5 percent type 1 error rate. That's what it means to be statistically significant at the level at which he tests. I have no reason to think that his procedure as applied in this case has any effect on that setting of

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his test. In fact, it -- as far as I know he kept it at that level.

Q. Are you certain that Dr. Hakala is testing at the 5 percent level?

A. I am -- I'm not certain that he is testing at the 5 percent level in all cases. Whether it's a 5 percent one-sided or two-sided level. I do know that there is reference to other levels in Dr. Hakala's report. But whatever level of test he was conducting, whether it's 5 percent or something else, that is the type 1 probability that he is controlling for and as far as I know I have no reason to think that it is effective in either direction by the procedure that he followed.

Q. You've published articles in peer reviewed publications, correct?

A. Yes.

Q. And you've published articles that deal with event studies in peer reviewed publications, have you not?

A. Yes, I have.

Q. In those articles did you use

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dummy variables to control for extraneous
events in your estimation period when you were
performing your event studies?

A. I don't recall one way or the other but certainly there -- I didn't do anything quite like Dr. Hakala's procedure in this case. But I did -- I used dummy variables extensively but I can't remember whether any of those was an extraneous event or not.

(Marais Exhibit 5, Journal of Financial Economics article entitled Wealth Effects of Going Private for Senior Securities, marked for identification as of this date.)

BY MR. SCHWARTZ:

Q. Dr. Marais, do you recognize this article?

A. I do.

Q. Did you write this article?

A. I co-authored it.

Q. Does this article discuss an event study methodology?

A. I believe it does. Or at least it

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implements -- as I -- it's been years since I looked at this article but I believe it included an event study.

Q. Okay. Could you turn to page 187, please.

A. I'm there.

Q. Appendix A-2. Do you see where it says Explanation period for index models?

A. I see that.

Q. And you write, "For most securities we estimate the index models using all available returns between event time minus 400 times and event time negative 70 days excluding multi-day returns whose duration exceeds one month."

Do you see that?

A. I do.

Q. Does that indicate to you that in the estimation period for this event study for the -- calculating the index model for the event study you used dummy variables to control for extraneous events?

MS. RODON: Objection.

A. It doesn't tell me one way or the

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other. To remind myself of exactly what we did in this article from some 19 years ago I would have to review the article. This is not where I would expect to find any reference to dummy variables for extraneous events in the article. It would -- whether or not -- whether we used them or not I could still say as I explained here earlier today that the event -- the estimation period ranged over a certain interval. I remember using -- we did use dummy variables or indicator variables in this analysis and I don't recall what kinds of events precisely were included in what we were coding and whether any of them were extraneous. I just don't remember one way or the other.

Q. Do you recall publishing event studies in which you didn't use dummy or indicator variables to control for events -- extraneous events?

MS. RODON: Objection.

A. I am -- it would be difficult or it's impossible for me to point to a particular example and say definitely there

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was no control for extraneous events in there but it wouldn't surprise me.

MR. SCHWARTZ: Okay. Can we -- I need to -- I'm almost done. I just want to make sure that I'm not missing something so if we could just take a five-minute break?

MR. STRAUSS: Sure.

THE VIDEOGRAPHER: Going off the record. The time is 2:39 p.m.

(Recess taken.)

THE VIDEOGRAPHER: I'm going to ask you to stand by, please.

We're back on the record. The time is 2:52 p.m.

BY MR. SCHWARTZ:

Q. Dr. Marais, a little bit before the break we were talking about type 1 errors. And I understood you to say that you didn't believe you had any reason to think that Dr. Hakala's use of dummy variables would increase his type 1 errors because of the level of statistical significance that he was applying; is that correct?

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MS. RODON: Objection.

A. Broadly, yes.

Q. Now, is it your position -- let's assume that Dr. Hakala was using a 95 percent confidence level using a two-tailed test. Would it be your position that it would make no difference to whether he finds an increased number of dates that satisfy that threshold incorrectly because of his use of dummy variables?

MS. RODON: Objection.

A. I'm trying to puzzle out the hypothetical which is why I'm -- or the question.

Q. Well, let me rephrase it. Maybe I can do a better job the second time around.

You said before that a type 1 error is a false positive, correct?

A. That's correct.

Q. Using the threshold -- let's assume that Dr. Hakala uses a 95 percent confidence level threshold for statistical significance using a two-tailed test. Let's assume that Dr. Hakala dummies out no dates in

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his -- or let's assume that Dr. Hakala dummies out the same number of dates he implemented in his event study the same way that he did.

Is it your view that that use of dummy variables has no effect on the number of dates that satisfy the 95 percent confidence threshold for significance?

MS. RODON: Objection.

A. Compared to what I have to say.

Q. Compared to had Dr. Hakala dummied out no dates. Or just the dates that were the events that he was looking at -- that were under study in this analysis.

MS. RODON: Objection.

A. Okay.

No, that would not be a correct statement. As I have -- as Dr. Hakala, Dr. Stoltz, and I myself have all three recognized and all three written in various ways.

Q. And is it your position that it would -- again, assuming Dr. Hakala uses this threshold for statistical significance and that he's only dummied out now the events that he is analyzing, the events and not the

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extraneous events, is it your position that his use of dummy variables as compared to this hypothetical situation does -- has no effect on the number of dates that are incorrectly assigned a statistical significance above the threshold under those circumstances?

MS. RODON: Objection.

A. If the test is properly calibrated, both tests, and that is -- in both situations, and that's -- I'm holding that as a maintained assumption, then the two tests are asking different questions. And what is a correct answer to one of those questions is not because the other one is a different question and is not necessarily a correct answer to the other question.

So when you say incorrectly, because of what I just explained, they're two different questions, when you say incorrectly, it's not clear to me what you mean in your question by incorrectly. Because something can be incorrect with respect to one question but not incorrect with respect to the other question. That's why it's ambiguous.

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Q. As compared to what would have happened had Dr. Hakala only used dummy variables for the event dates under analysis and not the extraneous event dates, does his use of dummy variables raise the risk that -- raise an increased risk of false positives?

MS. RODON: Objection.

A. Not necessarily. It does not necessarily change the rate of false positives at all. Understanding, as I have explained in my previous answers that there are two different questions being asked here. What is a false positive for one is not a false positive for the other.

Q. Is it possible that it changes the rates of false positives?

MS. RODON: Objection.

A. It is conceivable that the change in the question between the two situations has a subtle effect on the rate of false positives. I can't foresee as I sit here without doing a great deal more work whether there's any reason to expect that there is an effect of practically important size and what

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its direction would be if there is one. But I have no reason to expect as I sit here that there would be an effect.

Q. Moving to a new topic, we talked a little bit at the beginning of the deposition today about -- about your work as a consultant in a litigation capacity in which you've put in expert reports or given testimony in litigation matters.

Do you recall that?

A. I do.

Q. Again, using rough percentages, about what portion of the work that you do in that capacity is for the plaintiff's side of the case?

MS. RODON: Objection.

A. It would be less than 50 percent and substantially less than 50 percent. Perhaps -- of course, it's -- when I say percent we need to know percent of what. Of my hours or of discrete occasions.

Q. Let's --

A. And so it would be handy -- not, I hasten to add, that I can give you an accurate

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answer to any one of these but it's a small-ish fraction well below 50 percent whichever way you measured it.

Q. Let me ask you this. Do you more often put in expert reports or give testimony for the plaintiff's side or the defense side of the litigation cases you're involved with?

A. Although it is not something I keep track of because I don't use it in my work or do my work any differently, it is my sense that it is more often for the defense side.

Q. Have you ever been found by a court to be unqualified to serve as an expert?

A. I am not aware of any such occasion. It may be, for all I know, that in my absence a court decided that the subject of my testimony or the subject matter was not relevant or that it was excluded on some such grounds. But I don't even know as I sit here of such a case. I mention it just because I'm not sure I would know in every possible instance if it happened. But I don't know of any such occasion.

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1 L. MARAIS
 2 MR. SCHWARTZ: I have nothing
 3 further.
 4 MS. RODON: I have no questions.
 5 THE VIDEOGRAPHER: We're now going
 6 off the record. The time is 3:02 p.m.
 7 This the end of the tape labeled number
 8 three concluding this videotaped
 9 deposition.
 10 (Time Noted: 3:02 p.m.)

11
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 17
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 19
 20 LAURENTIUS MARAIS

21
 22 Subscribed and sworn to before me
 23 this ____ day of _____, 2008.
 24
 25

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1
 2 C E R T I F I C A T E
 3 STATE OF NEW YORK)

4 : ss.
 5 COUNTY OF NEW YORK)

6 I, FRANCIS X. FREDERICK, a
 7 Notary Public within and for the State
 8 of New York, do hereby certify:

9 That LAURENTIUS MARAIS, the
 10 witness whose deposition is
 11 hereinbefore set forth, was duly sworn
 12 by me and that such deposition is a
 13 true record of the testimony given by
 14 the witness.

15 I further certify that I am not
 16 related to any of the parties to this
 17 action by blood or marriage, and that
 18 I am in no way interested in the
 19 outcome of this matter.

20 IN WITNESS WHEREOF, I have
 21 hereunto set my hand this 25th day of
 22 August, 2008.
 23
 24

25 FRANCIS X. FREDERICK

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1
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 3 WITNESS EXAMINATION BY PAGE
 4 LAURENTIUS MARAIS MR. SCHWARTZ 5

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 9 ----- INFORMATION REQUESTS -----
 10 DIRECTIONS: NONE
 11 RULINGS: NONE
 12 TO BE FURNISHED: NONE
 13 REQUESTS: NONE
 14 MOTIONS: NONE

15
 16 ----- EXHIBITS -----
 17 MARAIS FOR ID.
 18 Exhibit 1
 19 Rebuttal Declaration of
 20 M. Laurentius Marais, Ph.D..... 14
 21 Exhibit 2
 22 Expert Report of
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 2 ----- EXHIBITS -----
 3 MARAIS FOR ID.
 4 Exhibit 3
 5 Affidavit of
 6 Scott D. Hakala, Ph.D., CFA..... 98
 7 Exhibit 4
 8 Journal of Corporate Finance article
 9 entitled Event studies with a
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1
2 NAME OF CASE: IN RE. AOL TIME-WARNER
3 DATE OF DEPOSITION: AUGUST 13, 2008
4 NAME OF WITNESS: LAURENTIUS MARAIS

5 Reason codes:

1. To clarify the record.
2. To conform to the facts.
3. To correct transcription errors.

6
7 Page _____ Line _____ Reason _____
From _____ to _____

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9 Page _____ Line _____ Reason _____
From _____ to _____

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11 Page _____ Line _____ Reason _____
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LAURENTIUS MARAIS

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